

**REMARKS**

Claim 1 has been canceled. Claims 2-3 have been amended. Thus, claims 2-3 are pending in the present application. Claim 2 has been amended to incorporate the subject matter of claim 1. The dependency of claim 3 has been changed accordingly. Thus, no new matter has been added.

Based upon the above considerations, entry of the present amendment is respectfully requested.

In view of the following remarks, Applicants respectfully request that the Examiner withdraw all rejections and allow the currently pending claims.

**Issues Under 35 U.S.C. § 103(a)**

The Examiner has rejected claims 1 and 3 under 35 U.S.C. § 103(a) as being unpatentable over Hattori (JP 09302155; hereinafter JP '155) in view of Majumdar (U.S. Patent 5,503,940; hereinafter Majumdar '940). Claim 2 also stands rejected under 35 U.S.C. § 103(a) as being unpatentable over JP '155 and Majumdar '940 as applied to claim 1, and in further view of Sandstrom (U.S. Patent 5,85,389; hereinafter Sandstrom '389). Applicant respectfully traverses.

The Present Invention and Its Advantages

The bead portion of a tire is in direct contact with the rim, and a chafer is often provided to prevent exposure of a tire reinforcing element due to abrasion of the bead portion (as discussed in Applicant's specification at page 1). A chafer can also strengthen the engagement between the tire and rim. In the case of a tubeless tire, the chafer maintains a constant internal air pressure. Chafers for heavy duty pneumatic tires undergo repeated severe deformation upon usage and highly exothermic conditions due to high internal pressure and heavy loads.

The present invention is a result of efforts to solve the problems that a chafer will encounter. Such problems include rim-slippage, creep, and toe-cracking (see pages 1-2 of the present specification for discussion of Rim-Slippage Resistance, Creep Resistance, and Toe-Cracking Resistance; see also page 3, lines 19-23), without compromises in tensile strength and elongation.

Specifically, the present invention is directed to a chafer rubber composition (or a heavy duty pneumatic tire comprising the chafer rubber composition in the bead portion). For the novel chafer rubber composition, 55-75 parts by weight of carbon black (having a nitrogen adsorption specific surface area of 70-120 m<sup>2</sup>/g) and 0.2-0.5 parts by weight of 1,3-bis(citraconimidomethyl)benzene are blended with 100 parts by weight of a rubber component containing 30-50 parts by weight of

natural rubber and/or polyisoprene rubber and 50-70 parts by weight of polybutadiene rubber. Further, the ratio S/A of a blended amount of sulfur S and a blended amount of vulcanization accelerator A is in a range between 0.25 and 0.5.

The advantages of the present invention have also been experimentally confirmed (see Table 3 on page 8 for the present invention; see Table 4 on page 9 for Comparative Examples; see also page 11, line 15 to page 12, line 4 for a discussion of these results). For example, the tested heavy duty pneumatic tires have unexpectedly achieved better resistance to abrasion (due to friction between the chafer and the rim sheet or rim flange), improved resistance to creep (due to the chafer receiving strong compressive stress from the rim flange and bead sheet), and better resistance to local deformation of the chafer toe portion. Further, because the ratio S/A of a blended amount of sulfur S and a blended amount of vulcanization accelerator A is in a range between 0.25 and 0.5, the tested heavy pneumatic tires achieve the required strength without degradation in thermostability (see Examples 7-11 in Table 3, wherein the respective S/A ratios are: 0.66 (Ex. 7); 0.5 (Ex. 8); 0.33 (Ex. 9); 0.25 (Ex. 10); and <0.25 (Ex. 11); see also page 5, lines 17-26 for a discussion on what happens when the S/A ratio falls outside the range of 0.25-0.5).

In other words, the present invention has achieved unexpected results in all three desirables areas of Rim-Slippage Resistance, Creep

Resistance, and Toe-Cracking Resistance. Such good results leads to better durability of the bead portion and, in the case of a tubeless tire, good air-tightness to maintain the internal pressure.

In contrast, the cited JP '155, Majumdar '940 and Sandstrom '389 references, in any combination, fail to disclose all features and advantages of the present invention.

#### Distinctions over the Asserted Combinations

Applicant respectfully submits that a *prima facie* case of obviousness has not been formed with respect to the asserted combination of JP '155 and Majumdar '940, and the combination of JP '155, Majumdar '940 and Sandstrom '389, because not all requirements for a *prima facie* case of obviousness have been satisfied.

U.S. case law squarely holds that a proper obviousness inquiry requires consideration of three factors: (1) the prior art reference (or references when combined) must teach or suggest all the claim limitations; (2) whether or not the prior art would have taught, motivated, or suggested to those of ordinary skill in the art that they should make the claimed invention (or practice the invention in case of a claimed method or process); and (3) whether the prior art establishes that in making the claimed invention (or practicing the invention in case of a claimed method or process), there would have been a reasonable expectation of success. See *In re Vaeck*, 947 F.2d, 488, 493, 20 USPQ2d

1438, 1442 (Fed. Cir. 1991); see also *In re Kotzab*, 55 USPQ2d 1313, 1316-17 (Fed. Cir. 2000); *In re Fine*, 5 USPQ2d 1596 (Fed. Cir. 1988).

In other words, the cited references must disclose or teach all features as claimed. In addition, the references themselves must state the motivation or suggestion to combine the references, and one having ordinary skill in the art must reasonably expect to be successful in achieving the present invention upon reading the references.

In applying case law such as *In re Vaeck* and *In re Kotzab*, a *prima facie* case of obviousness for the present application has not been established. This is because the primary JP '155 reference fails to disclose the chafer rubber composition as recited in claim 1.

The Examiner refers Applicant to Cols. 3-4 and Examples 2 and 1-2 of JP '155 for asserted disclosure of some features of the present invention (see page 2 of the Office Action). However, as mentioned in the Office Action, JP '155 fails to disclose 1,3-bis(citraconimidomethyl)benzene, and 0.2-0.5 parts by weight thereof. Applicant further submit that JP '155 also fails to disclose the ratio of sulfur S to a blended amount of vulcanization accelerator A is in a range between 0.25 and 0.5 as instantly claimed.

In addition, Majumdar '940 fails to account for the deficiencies present in JP '155. Majumdar '940 merely discloses elastomeric laminates containing a solventless elastomeric adhesive composition or cushion (see Abstract; Col. 1, lines 21-53). However, there is no

disclosure of a S/A ratio of 0.25 or more, or the S/A ratio being 0.5 or less.

Thus, the asserted combination of JP '155 and Majumdar '940 does not satisfy the initial requirement for a *prima facie* case of obviousness, and this rejection is overcome.

Similarly, Sandstrom '389 does not account for the deficiencies of JP '155 and Majumdar '940. The Examiner states that Sandstrom '389 discloses sulfur "as a possible additive material" in an amount of "0.5 and 2.25 phr" (see Office Action at page 4). However, this disclosure is not the same as "a ratio S/A of a blended amount of sulfur S and a blended amount of vulcanization accelerator A is in a range between 0.25 and 0.5" as instantly claimed. The asserted combination of JP '155, Majumdar '940 and Sandstrom '389 still does not disclose all features of the present invention.

Further, to pick and choose these references in order to achieve the present invention can only be accomplished by reading the present specification, review what is being claimed, and then applying substantial hindsight reconstruction by combining reference A, reference B and reference C.

However, this reconstruction is contrary to case law when the USPTO has simply chosen elements from cited references after considering the instant disclosure to order to come up with the components as presently claimed (*i.e.*, claim 2 or 3). The USPTO has, therefore, relied on an

impermissible level of "hindsight reconstruction" as a basis of support of the instant rejection. As stated by the Federal Circuit in *Sensonics Inc. v. Aerosonic Corp.* 38 USPQ2d 1551 (Fed. Cir 1996):

To draw on hindsight knowledge of the patented invention, when the prior art does not contain or suggest that knowledge, is to use the invention as a template for its own reconstruction -- an illogical and inappropriate process by which to determine patentability. *W.L. Gore & Assoc. v. Garlock, Inc.*, 721 F.2d 1540, 1553, 220 USPQ 303, 312-13 (Fed. Cir. 1983). The invention must be viewed not after the blueprint has been drawn by the inventor, but as it would have been perceived in the state of the art that existed at the time the invention was made. *Interconnect Planning Corp. v. Feil*, 774 F.2d 1132, 1138, 227 USPQ 543, 547 (Fed. Cir. 1985).

In addition to the above reasons of distinction, one having ordinary skill in the pertinent art would not be motivated or reasonably expect to be successful in combining JP '155 and Majumdar '940 (and Sandstrom '389) in order to achieve the present invention.

There are three possible sources of motivation to combine references: the nature of the problem to be solved, the teaching of the prior art, and the knowledge of persons of ordinary skill in the art. In *re Rouffet*, 149 F.3d 1350, 1357, 47 USPQ2d 1453, 1457-58 (Fed. Cir. 1998). However, one skilled in the art would not be able to account for the deficiencies of JP '155 and Majumdar '940, and be able to produce the present invention. There are simply too many differences between the cited references, whether properly combined or not, and the present invention (i.e., no disclosure of the claimed S/A ratio of 0.25 to 0.5). Further, the nature of the problem in Majumdar '940 is to produce

elastomeric laminators containing a cushion layer or an adhesive composition that is free of solvent (see Col. 1, lines 5-10, 57), and not a chafer rubber composition as instantly recited or the advantages of Rim-Slippage Resistance, Creep Resistance or Toe-Cracking Resistance.

There is no disclosure in the cited references of a need for a chafer rubber composition that reduces repeated deformation (better Rim-Slippage Resistance), resists break of the bead portion of the tire (better Creep Resistance), and gives less local deformation (causing the toe portion to crack, or better Toe-Cracking Resistance) as according to the present invention. In other words, no motivation or reasonable expectation of success exists in the cited references that one skilled in the art would need in order to produce the present invention. Thus, the other requirements for a *prima facie* case of obviousness have not been satisfied as well.

#### Unexpected Results Rebut a *Prima Facie* Case of Obviousness

Applicant further submits that the existence of unexpected results rebuts any asserted *prima facie* case of obviousness.

As mentioned, the present invention has achieved the unexpected results of improving all three of Rim-Slippage Resistance, Creep Resistance, and Toe-Cracking Resistance.

Further, because the ratio S/A of a blended amount of sulfur S and a blended amount of vulcanization accelerator A is in a range between



0.25 and 0.5, the present invention has produced a chafer rubber composition leading to the required strength without degradation in thermostability in a heavy duty pneumatic tire (see Examples 7-11 in Table 3 having certain S/A ratios; see also page 5, lines 17-26).

However, none of these advantages (nor all features as claimed) are disclosed in the cited references. Applicant has shown that the claimed S/A ratio of 0.25 to 0.5 leads to many desirable characteristics, such as improvements in strength at break, elongation at break, hardness and loss tangent, without the chafing or cracking in the tire (see results of Table 3). None of the cited references even disclose advantages such as better Rim-Slippage Resistance, Creep Resistance, and Toe-Cracking Resistance.

Thus, the only way to produce such as advantages (as according to the present invention) is to combine reference A with reference B (or references A, B and C). However, as mentioned, none of the references even when combined disclose all features of the present invention. Further, such asserted combinations are improper. Finally, the present invention has unexpectedly achieved results that rebut the cited combinations of references.

#### Conclusion

Accordingly, Applicant respectfully submits that the present invention incorporates subject matter that is patentably distinguishable

from the asserted combinations. This is because the cited JP '155, Majumdar '940 and Sandstrom '389 references fail to disclose all features as instantly claimed, and not all requirements for a *prima facie* case of obviousness have been satisfied with regard to the asserted combinations. Thus, Applicant respectfully requests the Examiner to reconsider and to withdraw all rejections and allow the currently pending claims.

A full and complete response has been made to all issues as cited in the Office Action. Thus, Applicant respectfully requests that the Examiner pass the application to issue.

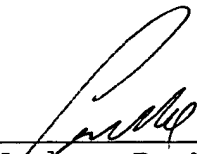
Should there be any outstanding matters that need to be resolved in the present application, the Examiner is respectfully requested to contact Eugene T. Perez (Reg. No. 48,501) at the telephone number of the undersigned below, to conduct an interview in an effort to expedite prosecution in connection with the present application.

**Attached hereto is a marked-up version of the changes made to the application by this Amendment.**

If necessary, the Commissioner is hereby authorized in this, concurrent, and future replies, to charge payment or credit any overpayment to Deposit Account No. 02-2448 for any additional fees required under 37 C.F.R. §§ 1.16 or 1.17; particularly, extension of time fees.

Respectfully submitted,

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Attachment: Version with Markings to Show Changes Made

(Rev. 02/20/02)

VERSION WITH MARKINGS TO SHOW CHANGES MADE

**IN THE CLAIMS:**

Claim 1 has been canceled.

The claims have been amended as follows:

2. (Amended) [The] A chafer rubber composition, [according to claim 1,] wherein 55-75 parts by weight of carbon black having a nitrogen adsorption specific surface area of 70-120 m<sup>2</sup>/g and 0.2-0.5 parts by weight of 1, 3-bis (citraconimidomethyl) benzene are blended with respect to 100 parts by weight of a rubber component including 30-50 parts by weight of natural rubber and/or polyisoprene rubber and 50-70 parts by weight of polybutadiene rubber, wherein a ratio S/A of a blended amount of sulfur S and a blended amount of vulcanization accelerator A is in a range between 0.25 and 0.5.

3. (Amended) A heavy duty pneumatic tire, [characterized in that it] wherein said heavy duty pneumatic tire employs in its bead portion the chafer rubber composition according to claim [1.] 2.